IN THE CLAIMS

Claims 1-36. (Canceled)

37. (new) An isolated nucleic acid molecule comprising

a regulatory sequence operably linked to a nucleic acid sequence that encodes an engineered ribonucleic acid (RNA) precursor, wherein the precursor comprises

(i) a first stem portion comprising a sequence of at least 18 nucleotides that is complementary to a sequence of a messenger RNA (mRNA) of a target gene;

(ii) a second stem portion comprising a sequence of at least 18 nucleotides that is sufficiently complementary to the first stem portion to hybridize with the first stem portion to form a duplex stem; and

(iii) a loop portion that connects the two stem portions.

38. (new) The nucleic acid molecule of claim 37, wherein the first stem portion is fully complementary to the mRNA sequence.

39. (new) The nucleic acid molecule of claim 37, wherein the second stem portion is fully complementary to the first stem portion.

40. (new) The nucleic acid molecule of claim 37, wherein the first stem portion is located at a 5' end of the RNA precursor.

41. (new) The nucleic acid molecule of claim 37, wherein the first stem portion is located at a 3' end of the RNA precursor.

42. (new) The nucleic acid molecule of claim 37, wherein the loop portion comprises at least 4 nucleotides.

43. (new) The nucleic acid molecule of claim 37, wherein the loop portion comprises at least 7 nucleotides.

44. (new) The nucleic acid molecule of claim 37, wherein the loop portion comprises at least 11 nucleotides.

45. (new) The nucleic acid molecule of claim 37, wherein the sequence of the mRNA is located from 100 to 300 nucleotides 3' of the start of translation of the mRNA.

46. (new) The nucleic acid molecule of claim 37, wherein the sequence of the mRNA is located in a 5' untranslated region (UTR) or a 3' UTR of the mRNA.

47. (new) The nucleic acid molecule of claim 37, wherein the first and second stem portions each comprise about 18 to about 30 nucleotides.

48. (new) The nucleic acid molecule of claim 37, wherein the first and second stem portions each comprise about 22 to about 28 nucleotides.

49. (new) The nucleic acid molecule of claim 37, wherein the first and second stem portions each comprise the same number of nucleotides.

50. (new) The nucleic acid molecule of claim 37, wherein one of the first and second stem portions comprises 1 to 4 more nucleotides than the other stem portion.

51. (new) The nucleic acid molecule of claim 37, wherein the regulatory sequence comprises a Pol III or Pol II promoter.

52. (new) The nucleic acid molecule of claim 37, wherein the regulatory sequence is constitutive or inducible.

53. (new) A vector comprising the nucleic acid molecule of claim 37.

54. (new) The vector of claim 53, wherein the vector is a plasmid or a viral vector.

55. (new) The vector of claim 54, wherein the viral vector is a retroviral vector.

56. (new) A host cell containing the nucleic acid molecule of claim 37.

57. (new) The host cell of claim 56, wherein the cell is a mammalian cell.

58. (new) A transgene comprising the nucleic acid of claim 37.

59. (new) An engineered RNA precursor comprising

(i) a first stem portion comprising a sequence of at least 18 nucleotides that is complementary to a sequence of a messenger RNA (mRNA) of a target gene;

(ii) a second stem portion comprising a sequence of at least 18 nucleotides that is sufficiently complementary to the first stem portion to hybridize with the first stem portion to form a duplex stem; and

(iii) a loop portion that connects the two stem portions.

60. (new) The precursor of claim 59, wherein the first stem portion is fully complementary to the mRNA sequence.

61. (new) The precursor of claim 59, wherein the second stem portion is fully complementary to the first stem portion.

62. (new) The precursor of claim 59, wherein the first stem portion is located at a 5' end of the RNA precursor.

63. (new) The precursor of claim 59, wherein the first stem portion is located at a 3' end of the RNA precursor.

64. (new) The precursor of claim 59, wherein the loop portion comprises at least 4 nucleotides.

65. (new) The precursor of claim 59, wherein the loop portion comprises at least 7 nucleotides.

66. (new) The precursor of claim 59, wherein the loop portion comprises 11 nucleotides.

67. (new) The precursor claim 59, wherein the sequence of the mRNA is located in a 5' untranslated region (UTR) or a 3' UTR of the mRNA.

68. (new) The precursor of claim 59, wherein the first and second stem portions each comprise about 18 to about 30 nucleotides.

69. (new) The precursor of claim 59, wherein the first and second stem portions each comprise about 22 to about 28 nucleotides.

70. (new) The precursor of claim 59, wherein the first and second stem portions each comprise the same number of nucleotides.

71. (new) The precursor of claim 59, wherein one of the first and second stem portions comprises 1 to 4 more nucleotides than the other stem portion.

72. (new) The precursor of claim 59, wherein the target gene is a human gene.

73. (new) The precursor of claim 59, wherein the target gene is a mutant human gene.

74. (new) The precursor of claim 59, wherein the target gene is a viral gene.

75. (new) A method of inducing ribonucleic acid interference (RNAi) of a target gene in a cell, the method comprising

obtaining a host cell of claim 56;

culturing the cell; and

enabling the cell to express the RNA precursor to form a small interfering ribonucleic acid (siRNA) within the cell, thereby inducing RNAi of the target gene in the cell.